



ATTAINMENT
TECHNOLOGIES, L.L.C.
EMISSION SOLUTIONS FOR TODAY

**2005 Louisiana Performance Contracting
Conference
New Orleans, LA**

Efficiency War is Brewing

- ◆ **Power is constrained, or congested, in many areas of the United States**
But demand continues to rise!
- ◆ **Many of these areas are located in non-attainment areas as designated by the Environmental Protection Agency (EPA)** *Over 40% of the country's population lived in counties with air quality concentrations above the NAAQS in 2000!**
- ◆ **Some states, regions and localities will not allow additional power plant construction** *Uncertainty, overbuild, NIMBY will force further plant construction delays.*
- ◆ **Demand Response/Load Curtailment programs continue to gain popularity** *But, thousands of engines cannot fully participate because of emissions!*
- ◆ **Tightening emissions rules and regulations** *Existing base of engines not likely to meet many regulations, but remain a valuable asset.*

*Source: EPA Office of Air and Radiation, July, 2002.

Smart Energy Management Drivers

Old drivers

- ◆ Conservation
- ◆ Cost Savings
- ◆ Reliability

+ New drivers =

- ◆ **Volatile Prices**
- ◆ **Renewable Portfolio Standards**
- ◆ Emissions
- ◆ Efficiency
- ◆ Security
- ◆ Shrinking supplies
- ◆ Congestion management
- ◆ Innovative rates – *LMP!?*
- ◆ T&D deferment
- ◆ Demand response
- ◆ National policy
- ◆ Technology
- ◆ Smart controls
- ◆ Liability (I.e. insurance)

Future

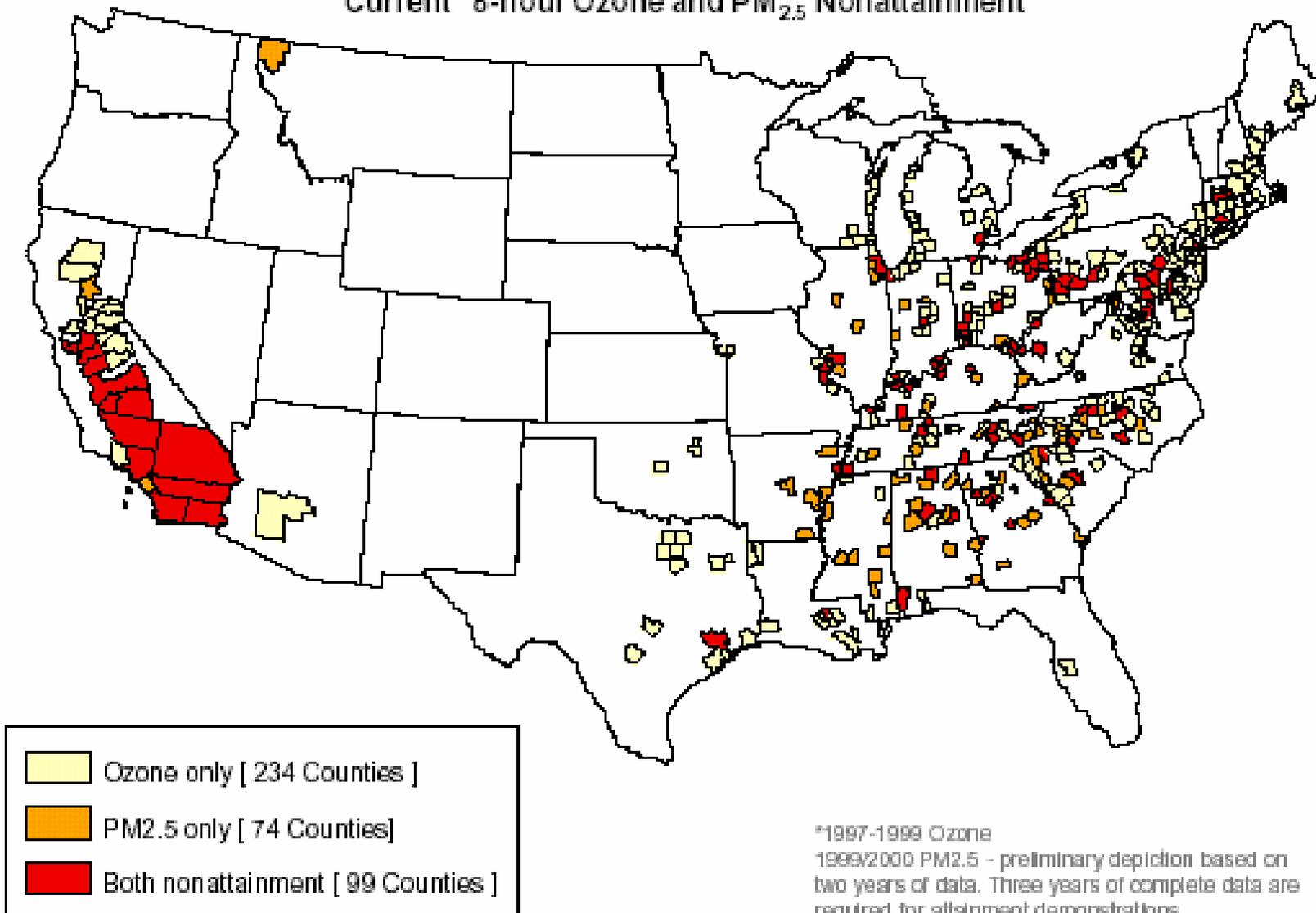
- ◆ **Smart Grid**
(automation; controls, demand response)
- ◆ **Efficiency Gains**
(increased load factors)
- ◆ **Clear Skies**
(emissions trading)

Pollution Reduction = Energy Efficiency =

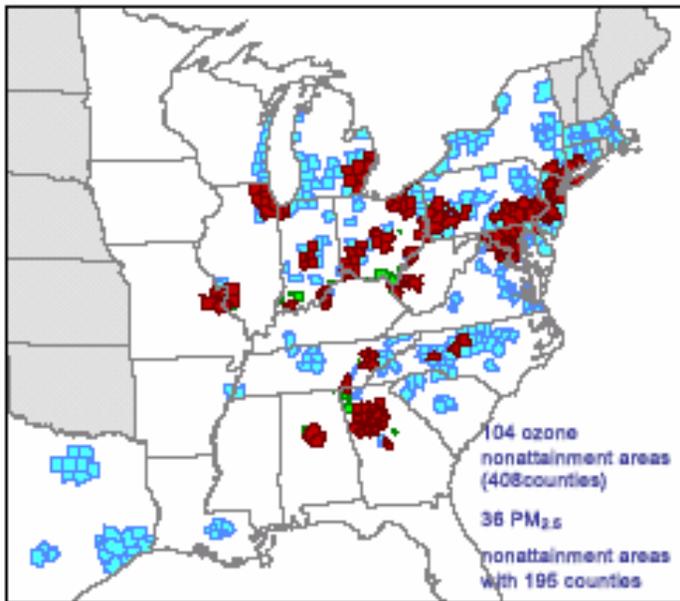


Many areas are likely to violate these Standards.

Current* 8-hour Ozone and PM_{2.5} Nonattainment



Clean Air Interstate Rule (CAIR)



- ◆ Finalized in March, 2005.
- ◆ Covers 28 states and DC, including Louisiana.
 - *Particular concern for New Orleans, Baton Rouge & Shreveport* areas.*
 - *Interstate trading may be allowed.*
 - *Phase 1 Cap in place 2009?*
- ◆ Uses cap and trade mechanism to achieve deep cuts in SO₂ and Nox.
 - *CHP and EGU*

Efficiency Improvement + Demand Reduction + Emissions Reduction =
Profitable Compliance?

Emissions Reduction Credits (ERC's)

- ◆ DEFINITION: 6 NYCRR 231-2.1(b)(14)
- ◆ *Emission reduction credit, ERC. Any decrease in emissions of a nonattainment contaminant in tons per year, occurring on or after November 15, 1990:*
 - ◆ (i) which is surplus, quantifiable, permanent, and enforceable; and
 - ◆ (ii) which results from a physical change in, or a change in the method of operation of an emission unit subject to Part 201 of this Title; and
 - a) is quantified as the difference between prior actual annual emissions or prior allowable annual emissions, whichever is less, and the subsequent maximum annual potential; and
 - (b) is certified in accordance with the provisions of section 231-2.6 of this Subpart; or
 - ◆ (iii) which results from a physical change in, or a change in the method of operation of an air contamination source not subject to Part 201 of this Title, and is certified in accordance with the provisions of section 231-2.6 of this Subpart.

Active ERC Markets (as of 2002)

State/Region	Price	Market Outlook
NY/PA Severe	\$15,000	Tight supply +
NY/PA Moderate	\$1,800	Oversupply -
New England Serious	\$6,000	Oversupply -
MD Severe	\$10,000	Tight supply +
VA Serious	\$10,000	Tight supply +
GA Serious	\$20,000	No supply
TX DFW	\$10,000	Tight +
TX HGA	\$10,000	RACT Change
CA San Diego	\$120,000	No supply
CA LA	\$45,000	Tight +
CA Others	\$8K - \$35K	Varies

HGA Emissions Reduction Credit Example

Potential to Emit Calculation

Annual run time	8760
Capacity	820
Conversion of kw to bhp	1.407
Conversion of gram to pou	454
Conversion of pound to ton	2000

Units	KW	HP	g/bhp-hr	grams/year	Lbs/year	Tons/year	
1	820	1153.74	9	90,960,862	200,354	100.18	currently permitted
1	820	1153.74	1.5	15,160,144	33,392	16.70	new rule
1	820	1153.74	0.5	5,053,381	11,131	5.57	11.13
1	820	1153.74	0.3	2,958,077	6,516	3.26	13.44

Potential ERCs in tons for Nox at 0.5 grams.	11.13
Market Value of ERCs for Nox/ton (2003 avg. NYC Severe Non-attainment area)	\$9,000
Cost of Conversion and Emissions technology per engine*	\$135,000
Aggregate Value of ERCs for Nox at 0.5 grams.	\$100,170
Difference between conversion cost and ERC value	\$34,830
Cost in \$/ton of Nox reduced	\$1,426.88

- Several Texas Non-attainment areas
 - HGA worst
 - Deadlines (MECT)
 - Liquid market (Prices vary per market conditions)
- DFW non-attainment, but no market- yet!
- Lower emissions requirements throughout East Texas
- **Potential to sell credits in Louisiana to Texas companies/districts?**

Pre-sell?

Buy-down project cost?

Price example per ton of Nox.

NOx ERC Values – NYC Example

- ◆ \$29,000 per ton was the highest trading price;
- ◆ \$3,800 per ton was the lowest trading price;
- ◆ At the height of demand for new power plant construction, prices were typically \$13,000, \$14,000, \$15,000 per ton;
- ◆ Average price since trading began is in the \$8,000 per ton range;

If CHP Were Adopted:

- ◆ 2200 MW's of CHP installed over the 10 Year period 2002-2012 has the following benefits:
 - ◆ \$1.825 Billion in User Savings
 - ◆ \$808 Million in net present value savings
 - ◆ Annual Emission Reductions in 2012
 - ◆ 10,282 tons of Nox
 - ◆ 27,766 tons of SO2
 - ◆ 3,854,000 tons of CO2

Louisiana Emissions Statistics

(2002) – in tons

- ◆ VOC: 77,781 tons
- ◆ NOX: 310,578 tons
- ◆ CO: 145,152 tons

Example: \$1,000 per ton NOx

Year One: 10,000 ton reduction x \$1,000/ton = \$10,000,000

Year Two: 20,000 ton reduction x \$1,000/ton = \$20,000,000

Cumulative Value = 30,000 ton Nox reduction = \$30,000,000
value